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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,391	08/30/2001	Patrick P. Naulleau	015780-041	1185

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EXAMINER

MATHEWS, ALAN A

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/944,391	NAULLEAU, PATRICK P.	
	Examiner	Art Unit	
	Alan A. Mathews	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 14-22 and 28 is/are rejected.
- 7) ☒ Claim(s) 9-13 and 23-27 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>8/01</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1-28 are objected to because there is no proper antecedent basis in independent claims 1 and 15 for the term “the illumination spot”. In addition, in claims 17 and 18, there is no proper antecedent basis in the claims for the expression “the source of partially coherent radiation”. The term “partially” does not appear in the parent claim 15. Claim 28 is objected to because “the optic” on line 2 of claim 28 has no proper antecedent basis in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. Claims 14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 14 states that the means for moving the reflective surface comprises tilting the optic in two dimensions. The only “optic” that was recited in the parent claim 1 is “a condenser optic”. But it is the reflective surface that is tilted in two dimensions, and not the condenser optic. Therefore, the expression “tilting **the optic** in two dimensions” is indefinite. With respect to claim 16, lines 1 and 2 of claim 16 recite “wherein step c comprises moving the reflective surface ----”. But step c is the re-imaging step that has a condenser optic

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(see claim 22). Step b is the step that moves the reflective surface. Therefore, “wherein step c” in claim 16 appears to be in error.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 5, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakashima et al. (U. S. Patent No. 5,534,970). Figure 7 and column 11, lines 42-67 disclose a source of coherent light 1. Reflective surface 54 receives incident radiation from source 1. Reflective surface 54 is moved through a range of angles in two dimensions (see column 1, lines 63-67). The condenser optic 14 re-images the moving reflective surface.

5. Claims 1, 2, 5, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Murski et al. (U. S. Patent No. 4,974,919). Murski et al. discloses in figure 2 and column 4, lines 57-59, and column 6, lines 33-37, a source of coherent radiation 11. Reflective surface 15 receives incident radiation from the source. Reflective surface 54 is moved through a desired range of angles in two dimensions (see column 6, lines 33-35). Element 17 is the condenser lens which re-images the moving reflective surface.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 4, 15-19, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakashima et al. (U. S. Patent No. 5,534,970) in view of either de Mol et al. (U. S. Patent No. 6,563,564) or the article entitled "Modification of the Coherence of Undulator Radiation", cited in Applicant's PTO-1449). Nakashima et al. discloses in figure 7 and column 11, lines 42-67, a source of coherent light 1. Reflective surface 54 receives incident radiation from source 1. Reflective surface 54 is moved through a range of angles in two dimensions (see column 1, lines 63-67). The condenser optic 14 re-images the moving reflective surface. Thus, Nakashima et al. discloses the invention except for specifically reciting that the radiation source is an undulator source or a synchrotron source. The patent to de Mol et al et al. discloses in column 6, lines 49-53, the use of an undulator or synchrotron LA in a lithographic projection device. The article entitled "Modification of the coherence of undulator radiation", discloses in the title and in the section with the heading "I. INTRODUCTION", the use of an undulator or synchrotron as a source of radiation. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide Nakashima et al. with an undulator or synchrotron as a source of the radiation in view of either de Mol et al. or the article entitled "Modification of the

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Coherence of Undulator Radiation” for the purpose of providing a better radiation source to make a more accurate final product.

8. Claims 8 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakashima et al. (U. S. Patent No. 5,534,970) as applied to claim 1 above and in view of Felter et al. (U. S. Patent No. 6,162,577). Nakashima et al. discloses the invention except for disclosing a condenser optic that is a single reflective element and disclosing that the radiation source is an undulator (claim 22). Felter et al. discloses in figure 1 a condenser 110 that is a single reflective element. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide Nakashima et al. with a condenser with a single reflective element in view of Felter et al. for the purpose of reducing the number of different types of optical elements. With respect to claim 22, Felter et al. discloses the use of a synchrotron radiation in column 2, line 60, and column 4, line 49. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide Felter et al. with synchrotron (undulator) radiation in view of Felter et al. for the purpose of providing a better radiation source to make a more accurate final product.

9. Claims 6, 7, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakashima et al. (U. S. Patent No. 5,534,970) in view of Hudyma (U. S. Patent No. 6,226,346, cited on Applicant’s PTO-1449). Nakashima et al. discloses the invention except for disclosing that the reflective surface comprises a multilayer-coating mirror and disclosing an undulator

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source of radiation. Hudyma discloses in column 3, lines 17-35, column 4, lines 14-20, and column 9, lines 54-67, the benefit of having reflective surfaces have multilayers for EUV devices including a better EUV radiation reflectivity. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to Nakashima et al. with multilayer-coated flat mirrors in view of Hudyma for the purpose improving the EUV radiation reflectivity of the mirrors. With respect to claim 20, Hudyma discloses in column 5, line 31, the use of a synchrotron radiation as a radiation source. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide Nakashima et al. with a synchrotron radiation source in view of Hudyma for the purpose of providing a better radiation source to make a more accurate final product.

Allowable Subject Matter

10. Claims 9-13 and 23-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and subject to correction of the objections to parent claims 1 and 15. The reasons for the indicated allowability of the above claims are as follows:

The prior art of record does not disclose or suggest that the reflective condenser element, which is a single reflective element, is spherical, in combination with the other elements in the parent claims of claims 9 and 23.

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The prior art of record does not disclose or suggest that the condenser optic is a single reflective multilayer-coated element in combination with the other elements in the parent claims of each of claims 10, 12, 24, and 26.

Conclusion

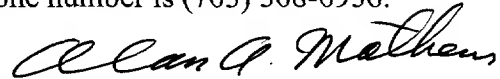
11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents on Applicant's PTO 1449 are cited for the same reasons Applicant cited them in his INFORMATION DISCLOSURE STATEMENT. The patent to Ichihara (U. S. Patent No. 5,307,207) is cited to show in figure 4 and column 10, line 42-45, vibrating the scanning mirror 17 two-dimensionally. The patent to Tichenor et al. is cited to show in figure 2 an EUV machine.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan A. Mathews whose telephone number is (703) 308-1706. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on (703) 308-2847. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A handwritten signature in cursive script, reading "Alan A. Mathews".

Alan A. Mathews
Primary Examiner
Art Unit 2851

AAM
August 9, 2003